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Notice of Allowability

Application No.

10/714,795

Examiner

John F. Ramirez

Applicant(s)

LI ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 02/12/2007.
2. ☒ The allowed claim(s) is/are 1-4,6-14 and 16.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Neil Jetter on May 3, 2007.

In the claims, attorney agreed to include the limitation of claim 6 into independent claims 1 and 11, to focus on the adaptive beamforming.

The application has been amended as follows:

(Claim 1) A method of examining biological tissue, comprising the steps of:
radiating a tissue region with a plurality of microwave radiation pulses, said plurality of radiation pulses spanning a range of microwave frequencies of at least 600 MHz, wherein said tissue region emits a plurality of thermoacoustic signals responsive to said plurality of microwave pulses, and

forming at least one image of said tissue region from said plurality of thermoacoustic signals,

wherein said step of forming at least one image comprises adaptive beamforming.

(Claim 11) A system for examining biological tissue, comprising: a microwave radiation source for radiating a tissue region with a plurality of microwave radiation pulses, said plurality of radiation pulses spanning a range of microwave frequencies of

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at least 600 MHz, wherein said tissue region emits a plurality of thermoacoustic signals responsive to said microwave pulses;

an acoustic transducer array for receiving said thermoacoustic signals, said transducer array providing electrical signals in response thereto, and

an imager comprising a signal processor having an executable adaptive beamforming algorithm,

said algorithm forming at least one image of said tissue region from said electrical signals.

The following is an examiner's statement of reasons for allowance:

After a careful review of the appeal brief submitted on February 12, 2007. The examiner of record concluded that claims 1-4, 7-14 and 16 are allowable over the prior art in view of appellant's arguments as disclosed on pages 7-21. Appellant has persuasively argued the issues summarize in the section title *Grounds of Rejection to be Reviewed on Appeal* on page 6. Conclusively, applicant's arguments overcome the rejections of record.

The prior art of record teaches thermoacoustic imaging using continuous fixed frequency microwave irradiation, not pulses. The prior art of record does not teach *inter alia*, a method of examining biological tissue, comprising the steps of: radiating a tissue region with a plurality of microwave radiation pulses, said plurality of radiation pulses spanning a range of microwave frequencies of at least 600 MHz, wherein said tissue region emits a plurality of thermoacoustic signals responsive to said plurality of microwave pulses, and forming at least one image of said tissue region from said

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plurality of thermoacoustic signals, wherein said step of forming at least one image comprises adaptive beamforming.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John F. Ramirez whose telephone number is (571) 272-8685. The examiner can normally be reached on (Mon-Fri) 7:30 - 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JFR


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